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THE JOURNAL OF PHILOSOPHY

A PRAGMATIC CONCEPTION OF THE *A PRIORI*.[1]

THE conception of the *a priori* points two problems which are perennial in philosophy; the part played in knowledge by the mind itself, and the possibility of "necessary truth" or of knowledge "independent of experience." But traditional conceptions of the *a priori* have proved untenable. That the mind approaches the flux of immediacy with some godlike foreknowledge of principles which are legislative for experience, that there is any natural light or any innate ideas, it is no longer possible to believe.

Nor shall we find the clue to the *a priori* in any compulsion of the mind to incontrovertible truth or any peculiar kind of demonstration which establishes first principles. All truth lays upon the rational mind the same compulsion to belief; as Mr. Bosanquet has pointed out, this character belongs to all propositions or judgments once their truth is established.

The difficulties of the conception are due, I believe, to two mistakes: whatever is *a priori* is necessary, but we have misconstrued the relation of necessary truth to mind. And the *a priori* is independent of experience, but in so taking it, we have misunderstood its relation to empirical fact. What is *a priori* is necessary truth not because it compels the mind's acceptance, but precisely because it does not. It is given experience, brute fact, the *a posteriori* element in knowledge which the mind must accept willy-nilly. The *a priori* represents an attitude in some sense freely taken, a stipulation of the mind itself, and a stipulation which might be made in some other way if it suited our bent or need. Such truth is necessary as opposed to contingent, not as opposed to voluntary. And the *a priori* is independent of experience not because it prescribes a form which the data of sense must fit, or anticipates some preëstablished harmony of experience with the mind, but precisely because it prescribes nothing to experience. That is *a priori* which is true, *no matter what*. What it anticipates is not the given, but our attitude toward it: it concerns the uncompelled initiative of mind or, as Josiah Royce would say, our categorical ways of acting.

[1] Read at the meeting of the American Philosophical Association, Dec. 27, 1922.

The traditional example of the *a priori par excellence* is the laws of logic. These can not be derived from experience since they must first be taken for granted in order to prove them. They make explicit our general modes of classification. And they impose upon experience no real limitation. Sometimes we are asked to tremble before the spectre of the "alogical," in order that we may thereafter rejoice that we are saved from this by the dependence of reality upon mind. But the "alogical" is pure bogey, a word without a meaning. What kind of experience could defy the principle that everything must either be or not be, that nothing can both be and not be, or that if x is y and y is z, then x is z? If anything imaginable or unimaginable could violate such laws, then the ever-present fact of change would do it every day. The laws of logic are purely formal; they forbid nothing but what concerns the use of terms and the corresponding modes of classification and analysis. The law of contradiction tells us that nothing can be both white and not-white, but it does not and can not tell us whether black is not-white, or soft or square is not-white. To discover *what contradicts what* we must always consult the character of experience. Similarly the law of the excluded middle formulates our decision that whatever is not designated by a certain term shall be designated by its negative. It declares our purpose to make, for every term, a complete dichotomy of experience, instead—as we might choose—of classifying on the basis of a tripartite division into opposites (as black and white) and the middle ground between the two. Our rejection of such tripartite division represents only our penchant for simplicity.

Further laws of logic are of similar significance. They are principles of procedure, the parliamentary rules of intelligent thought and speech. Such laws are independent of experience because they impose no limitations whatever upon it. They are legislative because they are addressed to ourselves—because definition, classification, and inference represent no operations of the objective world, but only our own categorical attitudes of mind.

And further, the ultimate criteria of the laws of logic are pragmatic. Those who suppose that there is, for example, *a* logic which everyone would agree to if he understood it and understood himself, are more optimistic than those versed in the history of logical discussion have a right to be. The fact is that there are several logics, markedly different, each self-consistent in its own terms and such that whoever, using it, avoids false premises, will never reach a false conclusion. Mr. Russell, for example, bases *his* logic on an implication relation such that if twenty sentences be cut from a newspaper and put in a hat, and then two of these be drawn at

random, one of them will certainly imply the other, and it is an even bet that the implication will be mutual. Yet upon a foundation so remote from ordinary modes of inference the whole structure of *Principia Mathematica* is built. This logic—and there are others even more strange—is utterly consistent and the results of it entirely valid. Over and above all questions of consistency, there are issues of logic which can not be determined—nay, can not even be argued—except on pragmatic grounds of conformity to human bent and intellectual convenience. That we have been blind to this fact, itself reflects traditional errors in the conception of the *a priori*.

We may note in passing one less important illustration of the *a priori*—the proposition "true by definition." Definitions and their immediate consequences, analytic propositions generally, are necessarily true, true under all possible circumstances. Definition is legislative because it is in some sense arbitrary. Not only is the meaning assigned to words more or less a matter of choice—that consideration is relatively trivial—but the manner in which the precise classifications which definition embodies shall be effected, is something not dictated by experience. If experience were other than it is, the definition and its corresponding classification might be inconvenient, fantastic, or useless, but it could not be false. Mind makes classifications and determines meanings; in so doing it creates the *a priori* truth of analytic judgments. But that the manner of this creation responds to pragmatic considerations, is so obvious that it hardly needs pointing out.

If the illustrations so far given seem trivial or verbal, that impression may be corrected by turning to the place which the *a priori* has in mathematics and in natural science. Arithmetic, for example, depends *en toto* upon the operation of counting or correlating, a procedure which can be carried out at will in any world containing identifiable things—even identifiable ideas—regardless of the further characters of experience. Mill challenged this *a priori* character of arithmetic. He asked us to suppose a demon sufficiently powerful and maleficient so that every time two things were brought together with two other things, this demon should always introduce a fifth. The implication which he supposed to follow is that under such circumstances $2 + 2 = 5$ would be a universal law of arithmetic. But Mill was quite mistaken. In such a world we should be obliged to become a little clearer than is usual about the distinction between arithmetic and physics, that is all. If two black marbles were put in the same urn with two white ones, the demon could take his choice of colors, but it would be evident that there were more black marbles or more white ones than were

put in. The same would be true of all objects in any wise identifiable. We should simply find ourselves in the presence of an extraordinary physical law, which we should recognize as universal in our world, that whenever two things were brought into proximity with two others, an additional and similar thing was always created by the process. Mill's world would be physically most extraordinary. The world's work would be enormously facilitated if hats or locomotives or tons of coal could be thus multiplied by anyone possessed originally of two pairs. But the laws of mathematics would remain unaltered. It is because this is true that arithmetic is *a priori*. Its laws prevent *nothing;* they are compatible with anything which happens or could conceivably happen in nature. They would be true in any possible world. Mathematical addition is not a physical transformation. Physical changes which result in an increase or decrease of the countable things involved are matters of everyday occurrence. Such physical processes present us with phenomena in which the purely mathematical has to be separated out by abstraction. Those laws and those laws only have necessary truth which we are prepared to maintain, no matter what. It is because we shall always separate out that part of the phenomenon not in conformity with arithmetic and designate it by some other category—physical change, chemical reaction, optical illusion—that arithmetic is *a priori*.

The *a priori* element in science and in natural law is greater than might be supposed. In the first place, all science is based upon definitive concepts. The formulation of these concepts is, indeed, a matter determined by the commerce between our intellectual or our pragmatic interests and the nature of experience. Definition is classification. The scientific search is for such classification as will make it possible to correlate appearance and behavior, to discover law, to penetrate to the "essential nature" of things in order that behavior may become predictable. In other words, if definition is unsuccessful, as early scientific definitions mostly have been, it is because the classification thus set up corresponds with no natural cleavage and does not correlate with any important uniformity of behavior. A name itself must represent *some* uniformity in experience or it names nothing. What does not repeat itself or recur in intelligible fashion is not a thing. Where the definitive uniformity is a clue to other uniformities, we have successful scientific definition. Other definitions can not be said to be false; they are merely useless. In scientific classification the search is, thus, for *things worth naming*. But the naming, classifying, defining activity is essentially prior to investigation. We can not interrogate experience in general. Until our meaning is definite and our classification

correspondingly exact, experience can not conceivably answer our questions.

In the second place, the fundamental laws of any science—or those treated as fundamental—are *a priori* because they formulate just such definitive concepts or categorical tests by which alone investigation becomes possible. If the lightning strikes the railroad track at two places, *A* and *B*, how shall we tell whether these events are simultaneous? "We . . . require a definition of simultaneity such that this definition supplies us with the method by means of which . . . we can decide whether or not both the lightning strokes occurred simultaneously. As long as this requirement is not satisfied, I allow myself to be deceived as a physicist (and of course the same applies if I am not a physicist), when I imagine that I am able to attach a meaning to the statement of simultaneity. . . .

"After thinking the matter over for some time you then offer the following suggestion with which to test simultaneity. By measuring along the rails, the connecting line *AB* should be measured up and an observer placed at the mid-point *M* of the distance *AB*. This observer should be supplied with an arrangement (*e.g.*, two mirrors inclined at 90°) which allows him visually to observe both places *A* and *B* at the same time. If the observer perceives the two flashes at the same time, then they are simultaneous.

"I am very pleased with this suggestion, but for all that I can not regard the matter as quite settled, because I feel constrained to raise the following objection: 'Your definition would certainly be right, if I only knew that the light by means of which the observer at *M* perceives the lightning flashes travels along the length *A—M* with the same velocity as along the length *B—M*. But an examination of this supposition would only be possible if we already had at our disposal the means of measuring time. It would thus appear as though we were moving here in a logical circle.'

"After further consideration you cast a somewhat disdainful glance at me—and rightly so—and you declare: 'I maintain my previous definition nevertheless, because in reality it assumes absolutely nothing about light. There is only *one* demand to be made of the definition of simultaneity, namely, that in every real case it must supply us with an empirical decision as to whether or not the conception which has to be defined is fulfilled. That light requires the same time to traverse the path *A—M* as for the path *B—M* is in reality *neither a supposition nor a hypothesis* about the physical nature of light, but a *stipulation* which I can make of my own free-will in order to arrive at a definition of simultaneity.' . . . We are thus led also to a definition of 'time' in physics."[2]

[2] Einstein, ***Relativity***, pp. 26–28: italics are the author's.

As this example from the theory of relatively well illustrates, we can not even ask the questions which discovered law would answer until we have first by *a priori* stipulation formulated definitive criteria. Such concepts are not verbal definitions, nor classifications merely; they are themselves laws which prescribe a certain uniformity of behavior to whatever is thus named. Such definitive laws are *a priori;* only so can we enter upon the investigation by which further laws are sought. Yet it should also be pointed out that such *a priori* laws are subject to abandonment if the structure which is built upon them does not succeed in simplifying our interpretation of phenomena. If, in the illustration given, the relation "simultaneous with," as defined, should not prove transitive—if event A should prove simultaneous with B, and B with C, but not A with C—this definition would certainly be rejected.

And thirdly, there is that *a priori* element in science—as in other human affairs—which constitutes the criteria of the real as opposed to the unreal in experience. An object itself is a uniformity. Failure to behave in certain categorical ways marks it as unreal. Uniformities of the type called "natural law" are the clues to reality and unreality. A mouse which disappears where no hole is, is no real mouse; a landscape which recedes as we approach is but illusion. As the queen remarked in the episode of the wishing-carpet; "If this were real, then it would be a miracle. But miracles do not happen. Therefore I shall wake presently." That the uniformities of natural law are the only reliable criteria of the real, is inescapable. But such a criterion is *ipso facto a priori.* No conceivable experience could dictate the alteration of a law so long as failure to obey that law marked the content of experience as unreal.

This is one of the puzzles of empiricism. We deal with experience: what any reality may be which underlies experience, we have to learn. What we desire to discover is natural law, the formulation of those uniformities which obtain amongst the real. But experience as it comes to us contains not only the real but all the content of illusion, dream, hallucination, and mistake. The *given* contains both real and unreal, confusingly intermingled. If we ask for uniformities of this unsorted experience, we shall not find them. Laws which characterize all experience, of real and unreal both, are non-existent and would in any case be worthless. What we seek are the uniformities of the *real;* but *until we have such laws, we can not sift experience and segregate the real.*

The obvious solution is that the enrichment of experience, the separation of the real from the illusory or meaningless, and the formulation of natural law, all grow up together. If the criteria of the

real are *a priori*, that is not to say that no conceivable character of experience would lead to alteration of them. For example, spirits can not be photographed. But if photographs of spiritistic phenomena, taken under properly guarded conditions, should become sufficiently frequent, this *a priori* dictum would be called in question. What we should do would be to redefine our terms. Whether "spook" was spirit or matter, whether the definition of "spirit" or of "matter" should be changed; all this would constitute one interrelated problem. We should reopen together the question of definition or classifiation, of criteria for this sort of real, and of natural law. And the solution of one of these would mean the solution of all. Nothing could *force* a redefinition of spirit or of matter. A sufficiently fundamental relation to human bent, to human interests, would guarantee continuance unaltered even in the face of unintelligible and baffling experiences. In such problems, the mind finds itself uncompelled save by its own purposes and needs. I *may* categorize experience as I will; but *what* categorical distinctions will best serve my interests and objectify my own intelligence? What the mixed and troubled experience shall be—that is beyond me. But what I shall do with it—that is my own question, when the character of experience is sufficiently before me. I am coerced only by my own need to understand.

It would indeed be inappropriate to characterize as *a priori* a law which we are wholly prepared to alter in the light of further experience, even though in an isolated case we should discard as illusory any experience which failed to conform. But the crux of the situation lies in this; beyond such principles as those of logic, which we seem fully prepared to maintain no matter what, there must be further and more particular criteria of the real prior to any investigation of nature whatever. We can not even interrogate experience without a network of categories and definitive concepts. And we must further be prepared to say what experimental findings will answer what questions, and how. Without tests which represent anterior principle, there is no question which experience could answer at all. Thus the most fundamental laws in any category—or those which we regard as most fundamental—are *a priori*, even though continued failure to render experience intelligible in such terms might result eventually in the abandonment of that category altogether. Matters so comparatively small as the behavior of Mercury and of starlight passing the sun's limb may, if there be persistent failure to bring them within the field of previously accepted modes of explanation, result in the abandonment of the independent categories of space and time. But without the definitions, fundamental principles, and tests, of the type which constitute such categories, no experience

whatever could prove or disprove anything. And to that mind which should find independent space and time absolutely necessary conceptions, no possible experiment could prove the principles of relativity. "There must be some error in the experimental findings, or some law not yet discovered," represents an attitude which can never be rendered impossible. And the only sense in which it could be proved unreasonable would be the pragmatic one of comparison with another method of categorical analysis which more successfully reduced all such experience to order and law.

At the bottom of all science and all knowledge are categories and definitive concepts which represent fundamental habits of thought and deep-lying attitudes which the human mind has taken in the light of its total experience. But a new and wider experience may bring about some alteration of these attitudes, even though by themselves they dictate nothing as to the content of experience, and no experience can conceivably prove them invalid.

Perhaps some will object to this conception on the ground that only such principles should be designated *a priori* as the human mind *must* maintain, no matter what; that if, for example, it is shown possible to arrive at a consistent doctrine of physics in terms of relativity, even by the most arduous reconstruction of our fundamental notions, then the present conceptions are by that fact shown not to be *a priori*. Such objection is especially likely from those who would conceive the *a priori* in terms of an absolute mind or an absolutely universal human nature. We should readily agree that a decision by popular approval or a congress of scientists or anything short of such a test as would bring to bear the full weight of human capacity and interest, would be ill-considered as having to do with the *a priori*. But we wish to emphasize two facts: first, that in the field of those conceptions and principles which have altered in human history, there are those which could neither be proved nor disproved by any experience, but represent the uncompelled initiative of human thought—that without this uncompelled initiative no growth of science, nor any science at all, would be conceivable. And second, that the difference between such conceptions as are, for example, concerned in the decision of relativity versus absolute space and time, and those more permanent attitudes such as are vested in the laws of logic, there is only a difference of degree. The dividing line between the *a priori* and the *a posteriori* is that between principles and definitive concepts which *can* be maintained in the face of all experience and those genuinely empirical generalizations which *might* be proven flatly false. The thought which both rationalism and empiricism have missed is that there are principles, representing the initiative of mind, which impose

upon experience no limitations whatever, but that such conceptions are still subject to alteration on pragmatic grounds when the expanding boundaries of experience reveal their infelicity as intellectual instruments.

Neither human experience nor the human mind has a character which is universal, fixed, and absolute. "The human mind" does not exist at all save in the sense that all humans are very much alike in fundamental respects, and that the language habit and the enormously important exchange of ideas has greatly increased our likeness in those respects which are here in question. Our categories and definitions are peculiarly social products, reached in the light of experiences which have much in common, and beaten out, like other pathways, by the coincidence of human purposes and the exigencies of human coöperation. Concerning the *a priori* there need be neither universal agreement nor complete historical continuity. Conceptions, such as those of logic, which are least likely to be affected by the opening of new ranges of experience, represent the most stable of our categories; but none of them is beyond the possibility of alteration.

Mind contributes to experience the element of order, of classification, categories, and definition. Without such, experience would be unintelligible. Our knowledge of the validity of these is simply consciousness of our own fundamental ways of acting and our own intellectual intent. Without this element, knowledge is impossible, and it is here that whatever truths are necessary and independent of experience must be found. But the commerce between our categorical ways of acting, our pragmatic interests, and the particular character of experience, is closer than we have realized. No explanation of any one of these can be complete without consideration of the other two.

Pragmatism has sometimes been charged with oscillating between two contrary notions; the one, that experience is "through and through malleable to our purpose," the other, that facts are "hard" and uncreated by the mind. We here offer a mediating conception: through all our knowledge runs the element of the *a priori*, which is indeed malleable to our purpose and responsive to our need. But throughout, there is also that other element of experience which is "hard," "independent," and unalterable to our will.

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WHAT IS THE PROBLEM OF KNOWLEDGE?

THE volume, *Essays in Critical Realism*, recently published by a group of American philosophers, bears the sub-title, "A Coöperative Study of the Problem of Knowledge." It is therefore fair to assume that the matters discussed constitute, for these authors, the crux of this problem. But to one who is in the habit of attaching distinct meanings to the terms *metaphysics* and *epistemology*, these writers as well as many of their contemporaries will seem hardly to have scratched the surface of the problem of knowledge, and to have been occupied almost wholly with questions which could be better described as metaphysical.

The problem before the minds of the critical realists is: How is knowledge related to something (let us call it *reality*), which is not knowledge? Is reality independent of or dependent on knowledge? Is it wholly or partially represented in knowledge, and if so, how? These difficulties are familiar enough in philosophy. They present again the dilemma of subject and object—of a knowing being with ideas and sensations, and an external world of existences alien to this being. Is this alienation complete? Or, is there a kind of *rapprochement* between reality and the mind in which it seems to make its appearance? The critical realists believe that before we can state a theory of knowledge, these problems must be solved.

Thus we are told, in the opening sentences of the essays, that "There are two familiar starting-points for knowledge, the objective and the subjective. The objectively-minded philosophers suppose that the data of perception are the very physical existents which we all practically believe to be surrounding and threatening our bodies. These physical objects themselves somehow get within experience, are directly apprehended; their surfaces constitute our visual and tactile data. The subjectively-minded philosophers suppose, on the contrary, that the data of perception are psychological existents, so many pulses or throbs of a stream of psychic life. At best they are merely copies or representatives of the outer objects."[1] By "starting-points for knowledge" we assume that the writer means "starting-points for a *theory* of knowledge," since it is obvious that one can *know* without inquiring whether his knowledge is subjective or objective, quite as readily as he can breathe without studying the anatomy of his thorax. This passage, therefore, asserts that a theory of knowledge must begin by solving the subject-object dilemma. And this is indeed what critical realism represents itself as having done.

In the same volume of essays, Mr. Santayana describes realism

[1] *Essays in Critical Realism*, Macmillan, 1920; "The Approach to Critical Realism," by Durant Drake, p. 3.

as follows: "Realism in regard to knowledge has various degrees. The minimum of realism is a presumption that there is such a thing as knowledge; in other words, that perception and thought refer to some object not the mere experience of perceiving and thinking. The maximum of realism would be the assurance that everything ever perceived or thought of existed apart from apprehension and exactly in the form in which it is believed to exist: in other words, that perception and conception are always direct and literal revelations, and that there is no such thing as error. If this is the range of realism, I think we may say that any reasonable theory of knowledge—any theory that does not abolish its own subject-matter—will occupy some point between these extremes, and will be more or less realistic."[2] Critical realism is intended to be this reasonable theory of knowledge which errs neither on the side of subjectivism or objectivism.

We are not concerned with the thesis of critical realism, with the semi-Platonic way in which, through the magic word "essence," it brings about an agreement between the world of perception and thought, and the world of reality. We are interested only in its statement of the problem.

It can be seriously doubted that a solution of the subject-object dilemma is prior and necessary to a theory of knowledge. If this were so it would be as if the physicist insisted that an analysis of the concept of *mass* is essential to a theory of mechanics, or as if the biologist refused to examine the laws of heredity without an adequate definition of *life*. Human knowledge is a fact: the study of its principles, its elements, its structure involves no answer to the more ultimate questions: How is this fact possible?—what is the relation of knowledge to reality? These questions must carry us beyond the analysis of knowledge to a theory of reality.

A theory—of anything—is a consistent body of hypothetical propositions from which all of the known true propositions within some field of experience can be deduced; and a good theory will explain everything, within a certain realm of experience, by deducing it from something else. Hence, a complete theory of knowledge will be (1) both a positive analysis of knowledge and (2) a metaphysics of knowledge; that is, it will both describe knowledge and will explain the relation of knowledge to reality. But this latter portion of the theory, since it involves propositions about the ultimate nature of the real, will logically supervene upon a more restricted inquiry—epistemology proper, which is the positive analysis of knowledge, the study of its elements, structure, and common characters as they appear in mathematics, the physical sciences, logic, ethics, and even

[2] *Ibid.*, Santayana, "Three Proofs of Realism."

metaphysics. Thus the order of the critical realists will be reversed: before the more general will come the less general. If we are to determine the final place of knowledge in reality, we must begin by examining knowledge as a natural phenomenon. The inconclusiveness of critical realism is, I believe, due to this fault in method. In Bacon's words, "they begin at once by establishing certain abstract and useless generalities" instead of rising "by gradual steps to that which is prior and better known in the order of nature."

Critical realism is not alone in its eagerness to mount to a metaphysics of knowledge before it has analyzed the facts of knowledge. The same charge can be brought against neo-realism and idealism, both subjective and objective. There is a current superstition that the adherents of these philosophies are occupied with the analysis of knowledge; and yet, for all of them, the central issue is metaphysical: How is the mind—or whatever we may choose to designate as the mind—related to the seemingly external non-mental world? Pragmatism, as originally stated by William James, is the only contemporary study of knowledge, with a distinctive name, which avoids metaphysics.

The confusion of metaphysics with epistemology can be traced to Locke, in whom the problem of the relation of ideas to realities makes its first formidable appearance. Locke's *Essay*, under the head of an investigation of human understanding, deals both with the positive analysis of knowledge, *i.e.*, its elements, structure, laws, and with the metaphysics of knowledge, *i.e.*, the relation of knowledge to reality. For Berkeley and Kant, metaphysics and epistemology are still intertwined, though the *Critique of Pure Reason* in distinguishing the transcendental esthetic and analytic from the transcendental dialectic makes a distinction which corresponds roughly to a separation of the positive theory of knowledge from the metaphysics of knowledge. However, the first philosopher who restricts himself to knowledge alone is Hume, and this is the result of his metaphysical skepticism: since he believed in no theory of reality, he advanced no theory of the relation of knowledge to reality.

In the present paper we wish to maintain that one can examine knowledge without being a critical realist, a neo-realist, and idealist, a Kantian, a Bergsonian, a Hegelian—without attaching himself to any system of metaphysics; and that such a positive analysis of knowledge is necessary to a theory of knowledge.

The weakness of theories which fly at once to metaphysics appears in their treatment of truth and error. From the outset they waive solutions of the problem of truth which are confined to phenomena, to "appearances." They do not admit the possibility of a definition of truth which leaves the nature of reality undetermined. They pre-

suppose that truth must be a revelation of reality. But there is no initial reason why knowledge should not be knowledge of appearances rather than of realities; and it is therefore theoretically more prudent to let sleeping dogs lie, and not to raise the question as to whether the object of knowledge is a reality.

But this is what the critical realists, the neo-realists, the idealists refuse to do. The critical realist defines truth as follows: "When we 'know' an object, we are assigning a certain 'essence'—a character or group of characters—to some reality existing independently of the knowledge-process. And as *truth is the identity of this essence with the actual character of the reality referred to,* so error stands for the lack of such agreement, and the ascribing of an ideal character to what we are mistaken in supposing to be real, or the ascribing to a reality of a wrong character instead of a right one."[3] In short, reality is essence; knowledge is knowledge *of* essence; knowledge is knowledge of reality; and truth is revelation of reality.

But what is *essence?* And why is *essence* reality? In the analysis of this term *essence,* the whole positive theory of knowledge lies concealed, and its difficulties are passed over without examination. We are told that an essence is a "character-complex." This suggests that knowledge has elements, that these elements form complexes, that characters or universals are necessary to these complexes. It suggests a positive study of knowledge, but it does not follow this suggestion. If we were to study the nature of essences we might discover that they can not be realities: certainly we ought not to identify them with realities before we study their nature. And yet, in his haste to solve the metaphysical problem and to prove that truth is a revelation of reality, the critical realist asks us to take it on faith that reality is *essence,* nothing more nor less.

The neo-realism of Mr. Holt similarly places the cart before the horse. He is interested in proving that reality is a system of *neutral entities,* neither mental nor physical. He believes, as does the critical realist, that truth must be a revelation of reality; but he recognizes that a false proposition must have an object, it must refer to something. He therefore proposes that falsity, also, is a revelation of reality. Thus the object "$2 + 2 = 5$" is a neutral entity, a reality, an objective falsehood. He asserts that the real, by its own nature, is self-contradictory; and this is the *reductio ad absurdum* of theories of knowledge which begin in metaphysics.[4] If the neo-realist could forget his metaphysical bias, if he were not

[3] *Essays in Critical Realism,* "The Problem of Error," by A. K. Rogers, p. 117.

[4] Holt, E. B., *The Concept of Consciousness,* 1914, p. 269.

concerned to show that an object which is known is always a *real* object, he might not be lead into this difficult position. He might then find an opportunity to study knowledge as a phenomenon. He might discover that a false proposition can mean something without referring to a reality which is self-contradictory.

Idealism has many forms, and we can speak only of an *ideal* idealism. Such a theory asserts that reality is the system of all judgments, the unity of all knowledge; and this rests again on the premise that a true judgment grasps reality. But, says the idealist, since knowledge could not reveal anything other than itself, reality and knowledge must be identical.

The humble analysis of knowledge, apart from metaphysics, lies at a lower level of presupposition than any of these speculations. It includes much of what is sometimes classified as philosophy of science or as logic. With Bacon, it "takes all knowledge to be its province"; but large as this province is, it need not be assumed to be so large as all reality. Some of the more important questions which it can ask are: What is a proposition? What is a scientific law? What is inference? What are truth, error, assertion, assumption? What is proof? What are possibility, probability, belief, certainty? But these questions fall within the positive analysis of knowledge only on the assumption that there is such a thing as knowledge: the sphere of inquiry is limited by this concept.

The right of the theory of knowledge to a province of its own can be established in the same way in which Mr. G. E. Moore establishes a similar right for the science of ethics.[5] To be "known" is a unique predicate, an unanalyzable and ultimate quality. To say that "x is known" is to make a synthetic judgment, and this demands that the predicate *known* be apprehended as peculiar and simple. It is as if we said, "x is green." We can no more reduce *known* to something else than we can reduce *green*. And if we say, with the metaphysicians, that to be known is to be in relation to a mind, we shall not have abolished the uniqueness of "being known" any more than we should have abolished the uniqueness of "being green" if we had explained greenness as the relation of light vibrations to the retina. Further, it can always be significantly asked of any explanation of knowing how this explanation is, itself, known, or whether it is known. Thus, if to be known is "to be in relation to a mind," we can inquire, without talking nonsense, "how is it known that to be known is to be in relation to a mind?" And unless we accept the predicate known as simple and ultimate, we shall be unable not only to answer this question, but also to ask it.

[5] *See* Moore, G. E., *Principia Ethica*, Cambridge, 1903, Ch. I.

The theory of knowledge, then, treats of all entities to which the predicate *known* can attach, as ethics treats of those to which the predicate *good* can attach. But the theory of knowledge is interested in these entities *qua known,* not *qua* natural objects. In Mr. Whitehead's language, the theory of knowledge thinks "heterogeneously" about nature;[6] which is "to think about nature in conjunction with the fact that nature is thought about"; and this is distinct from the "homogeneous" study of nature, which is "to think about nature without thinking about thought." The theory of knowledge being, in Mr. Whitehead's sense, a heterogeneous analysis, comprehends all of the sciences, not excluding psychology, logic, and metaphysics. But it asks a question different from that of any of these sciences, *viz.:* What elements of which the predicate "knowledge" can be asserted belong to these sciences, and why do we call these elements knowledge?

There are at least three varieties of knowledge: (1) true and (2) false, both of which are *mediate* knowledge; and (3) immediate knowledge, the latter variety being neither true nor false. Here, again, the analogy of ethics is helpful. Immediate knowledge is like intrinsic good; it derives its character as knowledge from nothing external to it. True and false knowledge, on the other hand, arise only through the relation of entities, *e.g.,* images, symbols, propositions, to something which is known immediately. True and false knowledge are like instrumental goods; they come into existence through the reference of propositions (or some other entities) to data, just as instrumental goods come into existence through the reference of actions to ends.

The distinction between mediate and immediate, or extrinsic and intrinsic knowledge goes to the root of the positive analysis of knowledge, as does the distinction of means and end to the root of ethics. It is the familiar distinction of knowledge by acquaintance and knowledge by description. And this most subtle of questions—how is mediate knowledge related to the datum which verifies or falsifies it?—has occupied every philosopher since Descartes. The failure to solve it is, I believe, due to the failure to isolate it from metaphysics as the central problem of the theory of knowledge.

The question opens three fields of investigation: (1) What things are immediately known, *i.e.,* what are data? (2) What is mediate knowledge? (3) What are the relations of mediate knowledge to data?

The metaphysician snaps up the first of these questions—the nature of a datum. Says Mr. Strong, in the *Essays in Critical Realism,* "Six different views as to the nature of this (the datum)

[6] Whitehead, A. N., *The Concept of Nature,* Cambridge, 1920, p. 3.

have succeeded each other in the course of modern philosophy: (1) That the datum is the real thing; (2) that it is an ideal representative of the real thing; (3) that it is an ideal thing, psychological in its nature; (4) that it is an ideal thing, logical in its nature; (5) that it is a thing of psychological nature, but real; (6) that it is a thing of logical nature, but real. . . . The view I shall try to recommend in this article, distinct from any of these, is (7) that the datum is the logical essence of the real thing.''[7]

There could be no clearer case of the flight to metaphysics. Mr. Strong interprets the entire history of the study of *data*, in modern philosophy, as a metaphysical quest, and eschews empirical examination of the things which we call *data*. He is interested only in the relation of the datum to reality, and he thus leaves aside all of the intermediate questions: How does a datum differ from knowledge which is not a datum? Is a datum the same or different from a thing thought or imagined? Is the datum a proposition? Are universals or relations a part of the datum? What elements in the datum can and what can not be analyzed, *i.e.*, is the datum simple or complex? What is perceptual analysis? These are the questions which point to the subject-matter of a positive theory of knowledge.

The following is a suggestion of one of many possible positive ways of approach to these questions: If we are to speak significantly of a thing as a datum, this thing must be distinguished from things which are not data. A key to this distinction is the conception of a symbol. Among all of the objects within any experience, some are symbols and some are the objects toward which symbols lead. (However, many objects are both symbols and the meanings of symbols.) Any object can become a symbol if it puts the mind in readiness to experience some other object. A symbol is a means to an end. And just as there is no significance in the term *end* unless it be differentiated from *means*, so the conception of a *datum*, a thing given, depends on the conception of a *quaesitum*, a thing asked or assumed. The function of a symbol is to anticipate or assume an object; and any object which does not make an assumption or ask a question is a datum, a thing given, and nothing more.

We see, however, that symbols are also data. They are objects given, though this does not exhaust their general character as pieces of knowledge. But it is not true that all data are symbols, though it is true that all symbols are data. Just as an end may be a means to another end, so a datum may be a symbol which leads to other data; and so on. However, there are data-in-themselves which are like ends-in-themselves: they lead no further.

[7] *Op. cit.*, Strong, C. A., ''On the Nature of the Datum,'' p. 223.

Thus the data of the significant group of symbols, "New York is in the United States," are the objects, *New York, United States,* and the relation *in,* joined in the way indicated in the symbols. (The manner of indicating the *order* of terms forms a chapter, by itself, in the study of symbolism.) But the data of the significant group of symbols, " 'New York is in the United States' is a grammatical sentence," include the *words,* "New York," "United States," and "in," and not the data to which these words refer.

Thus, when we say that an object is a datum, we consider it as an object apart from any further data of which it may be symbolic, though we recognize the fact that what is a datum of one symbol may be a symbol of another datum. However, if there were no symbols, all objects would be *data,* and we should therefore be unable to give any special significance to the term *datum.*

The conception of a symbol enables us to describe mediate knowledge as all significant systems of symbols; immediate knowledge as that for which mediate knowledge stands.

The most conspicuous examples of mediate knowledge are statements in words and writing, speeches and written records, books. But in addition, personal memory and imagination are examples of mediate knowledge. In these, the symbols are psychological images: memory is memory because the images in which it is embodied are symbols which refer to the past, *i.e.,* which "prepare the mind" for the past. Memory is imagination believing itself true, and referred to the past as its meaning.[8]

The conception of a symbol suggests an answer to the second and third questions of the theory of knowledge: What is mediate knowledge?—and what is the relation of mediate to immediate knowledge? We are usually told that mediate knowledge consists of propositions, concepts, objectives, essences,—entities of a Platonic nature and of a different status from perceptions or sensations. The theory of knowledge is then led into a view such as Meinong's, which postulates a world of subsistences, peopled with round squares, golden mountains, objective inconsistencies. It is possible, however, to view mediate knowledge, of which the chief vehicle is the proposition, as groupings of symbols, with their meanings; *meaning* being preparation for action or experience. Truth then attaches not to objectives or to essences, but to significant collections of symbols. Truth, as Hobbes said, becomes a property of words—of mental images and mathematical signs. Every significant collection of symbols, such as "Harding is the President of the

[8] *See* Demos, R., "Memory as Knowledge of the Past," *The Monist,* Vol. XXXI, No. 3, July, 1921, p. 397, for a non-metaphysical study of the problem of memory.

United States" or "New York is in South Africa," prepares the mind for a grouping of data. If there is no such grouping of data, the symbolic group is false. The discovery of such a complex of data is verification.

The manner in which a significant collection of symbols corresponds to a complex of objects is an intricate matter. The basis of this correspondence is the general principle of symbolism—that every symbolic group, if it has a reference as a whole, refers to a group of objects to whose constituents the constituents of the symbolic group refer. The complex symbol, "New York is in South Africa," is to be verified by a complex grouping of the data for which the single words stand. But this grouping must be one *such as* is indicated by the grouping of the words. (And here is a formidable, though not insoluble problem of the theory of knowledge.)

Such an approach to the problem of truth through the concept of a symbol is non-metaphysical; it is one among many possible non-metaphysical approaches. The study of symbols will be an important aspect of any positive analysis of knowledge. But the present paper makes no pretence of solving any of the problems of knowledge. It wishes merely to show that there are many such problems which do not touch metaphysical issues; that the metaphysics of knowledge must wait upon the empirical study of these problems.

The theory of knowledge has been shown to have a right to a status of its own, since to be "known" is to possess a unique and ultimate character; and the theory of knowledge is the study of the objects to which this predicate can properly belong: it is the study of these not *qua* natural objects, but *qua* known. Therefore, the positive theory of knowledge, as well as being the subject-matter of a metaphysics of knowledge, will furnish standards of criticism of this metaphysics. We can ask of such a metaphysical theory, is it valid knowledge? And the metaphysics of knowledge will not supply criteria of validity.

From psychology the theory of knowledge will draw many of its data: indeed, the character of being "known" may be purely psychological, but the positive theory of knowledge is not called upon to decide this question any more than it is to decide whether or not the object of knowledge is real. However, we can get from psychology no criteria of the validity of knowledge; and the positive theory of knowledge will furnish to psychology, as it does to metaphysics, general standards of the worth of knowledge.

So far as logic is a description of the derivation of true propositions from other propositions—of the processes of valid inference—logic will be a chapter in the theory of knowledge: it will treat of

special processes of knowledge, *i.e.*, deductive, and (if there is such a thing) inductive inference. Logic, however, as the science of the structure of systems of objects (and this is a possible definition of logic), will go beyond the theory of knowledge and will exhibit principles of structure which the theory of knowledge will, itself, follow. But the theory of knowledge, even in its relation to this wider logic, will retain its right of criticism: it can still ask, by what standards does this theory of logic claim validity?

The positive theory of knowledge, therefore, does not preclude a metaphysics of knowledge and does not exhaust psychology or logic; nor do psychology, logic, and metaphysics exhaust the theory of knowledge. But the theory of knowledge as it often comes to us, confusedly mingled with metaphysics, bears the same relation to the positive analysis of knowledge as alchemy to chemistry.

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TRADITION, METAPHYSICS, AND MORALS

IN his recent article on "The Chief Types of Motivation to Philosophic Reflection,"[1] Professor Robinson holds me up as a conspicuous example of the type in which "philosophy itself has become wholly subjected to the position of an instrument in social reform." The evidence cited in support of this classification is the following quotation from an essay of mine entitled "The Recovery of Philosophy": "This may, then, be looked upon as an attempt to forward the emancipation of philosophy from too intimate and exclusive attachment to traditional problems. It is not in intent a criticism of various solutions that have been offered, but raises a question *as to the genuineness, under the present conditions of science and social life, of the problems.*" To the quotation, Dr. Robinson adds the remarks: "Could any better proof of the existence of a sociological type of motivation to philosophic reflection be offered than this saying . . .? As if new social problems could destroy the pertinence of the perennial problems of philosophy!" (*Op. cit.*, p. 38.)

The adjective "perennial" appears to beg the question; new problems will hardly destroy perennial ones. But the text says "traditional." I have sometimes wondered if some thinkers might not be confusing the eternal or, at least, the perennial with the traditional; I was hardly prepared, however, for such a frank avowal of the identification. The text, moreover, qualifies the hypothesis offered concerning the bearing of present conditions upon tradi-

[1] This JOURNAL, Vol. XX, No. 2, pp. 29–42.

tional problems. It does not propose the abandonment of the latter; it tries to ease the transition by speaking of a process of emancipation from "too intimate and exclusive attachment" to them. But Dr. Robinson will have nought to do with taking advantage of the easement thus provided. The weaning process appears in his paraphrase as destruction. Again the text refers to present conditions of *science* as casting doubt upon traditional problems. But since Dr. Robinson is set upon offering the reader an example of a sociological type of motivation, reference to science disappears. And while the text speaks of social conditions, the paraphrase reads social problems—a change the more significant because the entire context of Dr. Robinson's discussion assumes that the sociological motivation is wholly concerned with remedying and reforming present ills, while the phrase "social conditions" implies that social *advances* may have put traditional problems in a different light. Finally the human term "social" is narrowed down to the professional term "sociological."

The omissions and changes suggest the famous philological derivation of Middletown from Moses. Cut off "oses" and add "iddletown" and you have it. I do not imply that the changes and omissions were made intentionally. On the contrary; perhaps they will not appear significant to Dr. Robinson even when they are pointed out. But if a philosopher writing in behalf of a disinterested scientific motivation is unwilling to perform the humble task of sounding the meaning of a passage which he quotes, what are the prospects that his philosophy will be able "to sound the depths of the infinite ocean of reality on which man's little bark is tossed"? (P. 41.)

The point at issue is not a personal one;[2] it concerns the relation of philosophy and metaphysics to morals in its broadest sense. This is itself one of the oldest and perhaps one of the questions of most distinctively perennial interest. It would appear that if any problem were worthy of disinterested inquiry into subject-matter in which indications of subject-matter shall supply the conclusion,

[2] In its personal aspect, however, I may point out that the very page from which Dr. Robinson quotes contains such a statement as this: "The limited object of my discussion will, doubtless, give an exaggerated impression of my conviction as to the artificiality of much recent philosophizing." And further qualifications are that a historic mode of approach would with a less limited object in view bring out the fact that some questions that are "now discussed mainly because they have been discussed" were genuine in their own setting. And it is also stated that "it would be a grateful task to dwell upon the precious contributions made by philosophic systems which as a whole are impossible" upon their "fertile and ample ideas." ("Recovery of Philosophy," pp. 5–6.) The reader can judge for himself the justice of the antithesis between "disinterestedness" and a Philistinish "sociological motivation."

it is precisely this problem. But note the paradox. Dr. Robinson, upholding the claims of disinterested scientific inquiry against those whom he conceives to cast aspersions upon it, settles the question by reference not to subject-matter but to "motivation"! His criterion is a moral one, and according to many moralists, a narrow one from even the moral point of view.

Here is a paradoxical inversion that is worthy of serious reflection. I will not go the extreme of saying that it suggests that aversion to recognition of the implication of moral issues in philosophy and metaphysics gives evidence of a desire to protect from examination a certain type of morals, a certain preconception as to the nature of what is ultimately good. But it is evident on its face that certain moral preconceptions are taken for granted without critical examination when an attempt is made to decide an issue by appeal to motivations. Says Dr. Robinson: "Knowledge for the sake of knowledge is the only *adequate and worthy* motivation to philosophic reflection and this is the scientific motivation" (p. 41, italics mine). This may turn out to be true. But true or false, nothing can disguise the fact that it is a moral judgment, while the very conception of disinterested scientific inquiry requires that truth or falsity be settled by examination of subject-matter, not by imputation of motives. As it stands we have Dr. Robinson's own moral *ipse dixit* for its truth. And this once more in an article devoted to ruling morals out of philosophy! Disinterested, I take it, is a moral term relating to the spirit in which alone inquiry can be successfully prosecuted. But as used by Dr. Robinson it implies that moral inquiry can not itself be disinterestedly pursued, and that only inquiry which sets out with the unshaken conviction that only "knowledge for the sake of knowledge" is "worthy" is disinterested. One would suppose that the *results* in and of knowledge might be left to adjudge the question as to what knowledge actually is. Why assume that those who reach the conclusion that "knowledge for the sake of knowledge" denotes knowledge functioning in life must already have set out with a particular moral warp and bias? There is just one way of settling the validity of the conclusion: by an examination of the argument and following whither it leads. But Dr. Robinson has an easier way, that of assigning motives. And this, let it be repeated once more, in a discussion which aims to protect philosophy from moral infection!

If I now return to the context of the passage quoted, it is not for personal reasons, but for the sake of a brief consideration of the issue of the relation of metaphysics to morals as an objective, "disinterested" issue. No one can take exception to the listing of metaphysical questions furnished by Dr. Robinson: "the problem

of the one and the many, of change and permanence, of mechanism and teleology, of form and matter, *etc.*" (p. 37). The sociological type of motivation declares, so he says, that these questions are all "obsolete." Since I am held up as the conspicuous living representative of this school, there is a plain implication that the "obsoleteness" of *these* questions is the same thing as the "non-genuineness" of traditional problems to which I referred in the passage quoted. On p. 40, the implication is made explicit, with a qualification to the effect that such questions are the ones whose genuineness I "presumably" doubt.

The one passage which Dr. Robinson quotes from me occurs on p. 5 of my essay. Pages 6–52 following are a discussion of just the traditional problems which it is conceived may be profitably regarded as not genuine under present conditions of science and social life. An inquiry would presumably not have to be so very disinterested to be aware that these pages are the place to look for light on the matter of just what questions I did have in mind. If Dr. Robinson was too bored with them to read them, I sympathize rather than blame. But in that case, why refer to me at all? Any one who consults these pages will perceive that there is in them no reference to the type of metaphysical problems to which Dr. Robinson refers, which he represents me as regarding as obsolete and not genuine. The traditional problems therein discussed are wholly the *psychological and epistemological* questions that, arising in the seventeenth century, were formulated in the eighteenth and dominated so largely nineteenth-century thought.

So far the discussion seems to be devoted simply to setting myself right personally. But the intent is impersonal. It is conceivable that emancipation from *these* problems of a tradition that developed no longer ago than the seventeenth century may be a helpful and indeed indispensable condition of "recovery" of the more objective metaphysical questions mentioned by Dr. Robinson. The psycho-epistemological tradition that inherits from the eighteenth century may be precisely one of the chief causes of the obscuration of the older and more objective questions of which the Greeks were aware. There are those beside unworthy pragmatists who entertain this belief.

Pages 53–58 of the essay on "Recovery of Philosophy" do, however, contain a critical reference to one tradition that goes back to Greek thought, a tradition which it is intimated the present condition of *science* should emancipate us from: *viz.*, the identification of philosophy with knowledge of *the* real object, that is, of reality which is regarded as superior in degree and kind to the realities of everyday life and natural science. Two things should here be

noted. First, this identification in the end is accountable for the *solution* which classic Greek thought gave to the metaphysical problems, a solution which leaned to the side of the one, the permanent, the form, and against the equal claims of the many, the changing, and matter. Even though the problems are perennial in interest, a recognition of the genuineness of the Greek problems surely does not commit us in advance to an acceptance of classic Greek conclusions. The other point is that whenever we have the distinction of higher and lower reality, superior and inferior being, we have a moral distinction, a distinction of better and worse. The traits of existence as an object of *metaphysical* inquiry are not (till we bring in moral considerations) concerned with questions of higher and lower grades or ranks of being. Plato taught that non-being in some sense *is*, even though he ranked it lower morally than being (which according to him in some sense is not). Accordingly, in criticizing this particular tradition as not genuine "under the present conditions of science" one is questioning an element in the *moral* tradition. And a moral inquiry should, it would seem, be allowed at least to submit to inquiry moral elements in the philosophic tradition, even if it must keep hands off the metaphysical elements.

And this brings us to the gist of the question. If emancipation from recent psycho-epistemological traditions should turn out to serve as a means of return to disinterested inquiry to questions concerning the nature of things, there arises an important problem: How are metaphysical distinctions related to moral distinctions and issues? This is a question not of motivation, but of subject-matter. If those are wrong who hold that a disinterested historic inquiry will show that the Greek classical metaphysics erred in its metaphysical conclusions precisely of a *moral* bias in favor of the one, the unchanging, and formal as against the many, change, and material, they can hardly be shown to be wrong by an imputation of motives, but only by an examination of pertinent subject-matter. If they are wrong in holding, aside from the historical question, that metaphysical distinctions are intimately connected with moral distinctions and issues, that, too, is a question not to be disposed of by alleging motives, but by an examination of subject-matter and by following whither it leads.

It is the importance of the question, not a particular solution of it, which is asserted. But when Dr. Robinson declares that "sociological" interest has never produced a great piece of philosophical literature (p. 39), I beg to refer him to the *Republic* and *Laws* of Plato. One who follows Plato laggardly and from afar may cite, when it comes to appeal to authority, Plato as authority for the conviction that the Good is the central metaphysical con-

cept and fact, and may remind anyone concerned that if anyone ever made philosophy an instrument of political reform and organization, it is this same Plato. It would require a fervor of "sociological" motivation in philosophy hardly to be found to-day to suggest that "philosophers should be kings," and to assert that till they are kings social ills and discords will not be remedied. Again, since Dr. Robinson cites Royce with respect, others who also hold him in respect may quote from the same writing from which Dr. Robinson quotes: "Philosophy . . . has it origin and value in an attempt to give a reasonable account of our own personal attitude toward the more serious business of life. You philosophize when you reflect critically upon what you are actually doing in your world. What you are doing is, of course, in the first place, living."[3] A consideration of the infinite ocean of reality hardly becomes of necessity biased when we include the bark, however frail and however fluctuating it may be, as a significant part of the ocean, and include within our disinterested inquiry a sense of the bearing of the inquiry upon the course and direction of the tossing bark of humanity.

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BOOK REVIEWS

Religione e Scienza. Saggi Apologetici—II. FR. AGOSTINO GEMELLI. Milano: Società Editrice "Vita e Pensiero." 1922. 2d. ed. Pp. xii + 370.

P. Gemelli's second volume of "Apologetic Essays" revolves around the question of the relations of religion and science, and though not offering particularly original material, is worthy of notice because of the author's standing in the field of experimental science, and because the book carries the Imprimatur of the Roman Catholic Church.

The first essay resumes, from a philosophical standpoint, the status of "The Conflict Between Religion and Science," and gives a trenchant summary of the author's Neo-Scholastic position. There can be no actual conflict between the two, provided we identify "religion" with "Catholicism." On the contrary, there is a harmony between them, for both offer valid avenues of approach to the Truth of the universe, which is one and unalterable.

We have, P. Gemelli says, three ways of acquiring knowledge. We may determine the nature of an object by experimentation. We may be told what is its nature by some person whom we trust. Or

[3] Royce, *Spirit of Modern Philosophy*, pp. 1, 2.

we may reach the same conclusion by reasoning. In each case, the "material content" of the proposition remains the same, while the form alters (p. 31). Now it happens, he continues, following Fonsegrive in his *Le Catholicisme et la Vie de l'Esprit,* that we have a revealed, absolutely true body of knowledge in the dogmas of the Roman Catholic Church. And we know any religious truth, such as the resurrection, "thanks to the authority of the Church, which teaches it to us, and which orders us by its authority to hold it a truth of faith; and as, by knowledge acquired in precedence, we hold that the authority of the church is infallible"—P. Gemelli does not explicitly discuss the "knowledge acquired in precedence," nor give an account of its source, rational status, and theoretical validity,—"we can therefore hold as faith that Jesus Christ arose again from the dead" (p. 32). The dogmas of the Roman Catholic Church are materially true, and the only thing science can question concerning them is whether it is possible or not to exhibit them in scientific form. If they can not be exhibited in scientific form, this does not in the slightest alter their "material truth." This procedure of exhibition conveys the real meaning of the term "autonomy of science." The scientist "has no need of a greater liberty than this" (p. 31). In his own field, where the dogmas of the Church are not concerned, he is, of course, permitted to go beyond the mere investigation of whether a proposition can be put in scientific form or not, and come to a definite conclusion concerning some "material" truth in the natural world. "If, accordingly," proceeds the author, "liberty is complete in both fields, if independence is entire during researches of a special and analytical character, at the moment of synthetic confrontation" (of separately acquired propositions), "in case of an apparent conflict, *the less useful and less certain mode of knowledge should give place to the most useful and most certain*" (p. 48. The italics are mine). And this is backed up by a quotation from the *Constitutio De Fide* of the Vatican Council: "Sed justam hanc libertatem agnoscens, Ecclesia id sedulo cavet no divinæ doctrinæ repugnando errorem in se suscipiant humanæ artes et disciplinæ, aut fines proprios transgressæ ea, quæ sunt fidei, occupent et perturbent."

Thus, on this interesting theory of knowledge, with its pragmatic twist at the end, the conflict of science and Catholicism is solved.

Three of the further essays contain excellent accounts of scientific problems and research touching intimately certain concepts of religious faith. Krall's "reasoning" horses, the possibility of keeping alive extirpated organs, spiritualistic phenomena—each furnishes the subject of an article, clearly expounded, carefully documented, lucidly and interestingly written. And the scientific conclusions

reached by P. Gemelli on the basis of an examination of the evidence, preserve safely the proper doctrines concerning the denial of "spontaneous intelligence" to "brute" creation, the indivisible unity of life, the survival of the soul. The concluding two essays dwell on historical controversies; one defends Saint Charles Borromeo from the accusation of having been instrumental in spreading the pest in Milan during the great visitation of 1576–77 by ordering religious processions through the city; the other gives an excellent account, with an impartial and conveniently full transcription of relevant documents, of the vicissitudes of Galileo Galilei and his Copernican views at the hands of the Inquisition, concluding that Galilei was at fault not in his contentions but in his ways of contending, and that there is no evidence of his ever having been tortured.

Admirable as are the care and frankness of P. Gemelli's approach and exposition throughout his book, the non-Catholic layman will hardly find his solution of the conflict between religion and science convincing. Can the scientist, no matter what field he approaches, really be satisfied with the rôle of investigating the mere form of propositions already known to be true? Is not the scientist's aim the acquisition of a body of material truths as a result of a critical sifting of evidence produced by the experimental method—in the substitution of which for pure speculation P. Gemelli himself sees "the never sufficiently recognized greatness of Galileo" (p. 317)? Does not the real conflict between science and religion arise when the rational observation of science results in a "material" truth actually contradicting some "material truth" advanced by dogma?

It may, or may not, be true that certain matters are incommensurable with the methods and categories of science; but to assign all conflicts to such a situation of incommensurability seems like begging the question. What if science should come to the experimentally observed and carefully consistent conclusion that brutes *do* sometimes reason? That extirpated organs do, under certain conditions, continue to show *all* the characteristic features of life? Can we actually say, *a priori,* that such conclusions may not be reached, or that if they are reached there is anything in them essentially incommensurable with the rational method of science?

But P. Gemelli expressly defends himself against the theory of "watertight compartments," and insists that there always comes "in every question a moment in which the conclusions of theology and science must be confronted. . . ." If contradictions should appear, we must fall back for their explanation on human frailty, and for their solution on that which is "most useful and most certain."

But what—we ask—is the criterion of usefulness and certainty proposed by the author? Amenability to reason? Or "being told

us by some one else''? If the first is the case, is not dogma subordinate to reason? If the latter: must we not give some (rational?) proof or evidence that ''being told by an authoritative source'' is a category of knowledge coördinate with, or in certain cases superior to, other categories?

Whoever defends this standpoint must write a new ''Kritik aller Offenbarung'' before he can claim that he has solved the problem of the conflict of science and authoritative dogma.

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JOURNALS AND NEW BOOKS

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NOTES AND NEWS

Note on Costello's Review of "Mathematical Philosophy"

I desire to thank Professor Costello for calling attention in his review (this Journal, March 1, 1923) to the fact that in the book (page 321) I ascribed to Professor Bliss Perry the authorship of a work not written by him. I regret the blunder and I desire to apologize publicly and humbly to Professor Bliss Perry and to any reader who may have been misled.

I should like to say a word respecting the review as a whole. In any serious book review, one may rightly expect to find two portraits: one of the book and one of the reviewer. In the nature of things, the latter portrait is apt to be revealing in proportion as the former one is difficult to execute. *Mathematical Philosophy* was written for many different classes of readers—philosophers, mathematicians, psychologists, teachers, critics, sociologists, engineers, and educated laymen. It is obvious that the portrait of any such book is not easy to draw. I could wish that the two portraits shown in Professor Costello's review were equally revealing.

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One of the men who have helped us to freedom in science and to a really scientific conscience is John Theodore Merz, and the Philosophical Society of the University of Durham has devoted the last number of its *Proceedings* (Vol. VI, Part 4) to a memorial appreciation of him and of his work. There are four articles of personal reminiscence and an article on the philosophical work of Dr. Merz by Professor R. F. A. Hoernlé which fills fifty-eight very interesting pages. There are two excellent portraits of Dr. Merz, one at the age of sixty, taken in 1900, and the other taken in 1921.

Copies of this number of the *Proceedings* of the society can be obtained from the Librarian, Armstrong College Library, Newcastle-upon-Tyne, England.